DEQ NORTHWEST REGION
COMPLIANCE EVALUATION INSPECTION
SOLOPOWER SYSTEMS, INC.
6308 N. MARINE DRIVE
PORTLAND OR 97203
EPA ID# ORQ000030450

State of Oregon Department of Environmental Quality

Inspection Dates: December 8 and 11, 2015
DEQ Inspectors: Laurey Cook, Rick Silverman, Heather Kuoppamaki
Facility Representatives: Ex. 6 PP / Ex. 7(C)
Ex. 6 PP / Ex. 7(C)

Prepared by _____ on _____

GENERAL INFORMATION

Purpose of Inspection

The Department of Environmental Quality (DEQ) conducted an unannounced inspection of SoloPower Systems, Inc. to determine its compliance with the Federal Resource Conservation and Recovery Act (RCRA), the Oregon Revised Statutes (ORS) and the Oregon Administrative Rules (OAR) standards for managing hazardous waste. The US Environmental Protection Agency authorized DEQ to regulate hazardous waste management in Oregon. The purpose of these laws and rules is to prevent releases of hazardous waste onto the land, into the air, or to surface or groundwater, and to ensure proper handling and cleanup if releases occur.

Facility Background Information and Compliance History

SoloPower manufactures copper indium gallium selenide thin-film flexible photo-voltaic solar panels. The copper, indium, gallium, and selenium are plated onto a flexible backing. This plating process generates selenium contaminated hazardous waste, corrosive hazardous waste and F006 listed hazardous waste. Hazardous waste toxins cadium and silver are also used in the manufacturing process, and generate wastes which may be hazardous waste.

In 2011 DEQ issued Solopower Holding Company a RCRA ID number. In 2012 Solopower Holding Company reported as a large quantity generator of hazardous waste generating 14 waste streams including cadium, silver, selenium wastes, filter wastes, and F006 hazardous waste sludge. In 2013, Solopower notified DEQ that it changed ownership and its name changed to SoloPower Systems, Inc. The Secretary of State Database shows SoloPower Systems, Inc. incorporated July 16, 2013.

In 2014 SoloPower contacted DEQ's technical assistane program and self-reported exceeding the 90-day accumulation time limit. In June 2014 Solopower worked with DEQ's technical assistance program and properly disposed of the hazardous waste. DEQ did not cite this as a violation because it was under the technical assistance program and self reported.

In 2014 Solopower reported managing the following hazardous wastes:

- 3,256 pounds characaterization lab waste – D006, D010, D002
- 2,349 pounds selenium waste water – D010
- 131 pounds of debris contaminated with screenwash and metals – D006, D010, D011
- 417 pounds of sulfuric acid copper – D002
- 99 pounds of selenium dust – D010
- 66 pounds of silver contaminated debris – D011
- 4,865 pounds of cadmium and selenium contaminated debris – D006, D010
- 2,106 pounds of ion exchange resin – F006, D006 (with 2,106 reported to remain on site and 936 carried over from the previous year)
- 8,190 pounds of ion exchange resin from plating – F006 (with 8,190 reported to remain on site)
- 1,404 pounds of ion exchange resin (MB1) – F006, D006 (with 1,404 reported to remain on site)

PERMITS

DEQ issued SoloPower a simple Air Contaminant Discharge Permit for air emissions. The City of Portland regulates water discharges from this facility.

FACILITY INSPECTION

At approximately 10:00 AM on December 8, 2015, Rick Silverman and I arrived at SoloPower. We announced that we were there to conduct a hazardous waste inspection. We met with Ex. 6 PP / Ex. 7(C) Ex. 6 PP / Ex. 7(C) and informed us that Ex. 6 PP / Ex. 7(C) generally manages the hazardous waste. Ex. 6 PP / Ex. 7(C) was at an environmental conference. Ex. 6 PP / Ex. 7(C) Ex. 6 PP / Ex. 7(C) then accompanied us on the site inspection. Mr. Silverman and I explained that we would like to begin the inspection at the 90-day accumulation area.

90 DAY ACCUMULATION AREA

At the 90-day area we observed one-cubic yard containers marked as hazardous waste and a one-cubic yard container of hazardous waste that was not marked as hazardous waste and not marked with an accumulation start date. One of the containers was marked as silver, it was dated 5/11/15. If recycled this waste may be managed under the precious metals exemption. The other containers were as follows:

- cadium and or selinum contaminated debris dated March 1, 2015
- wastewater filter and debris dated January 21, 2015
- wastewater filters dated January 12, 2015
- wastewater filter and debris dated December 11, 2014
- cadmium selenium dated January 15, 2015
- one box not dated or marked with an accumulation start date

The dates and waste quantity show that SoloPower was a large quantity generator when this waste was created. A large quantity generator must dispose of its hazardous waste within 90 days of the date of

generation. SoloPower exceeded the accumulation time standard allowed for hazardous waste. The boxes had less than one foot of aisle space and were placed along two walls, so that the labels and boxes were not easily visible or accessible.

We observed five buckets, silver in color, that contained selenium waste. This waste is hazardous waste unless it can be recycled without reclamation. SoloPower set these buckets aside as it indicates it has a buyer for the selenium. I requested that SoloPower send me information regarding the buyer so that I can further evaluate the buyer's process and determine if the selenium is product or hazardous waste.

In addition to the hazardous waste and selenium slated for recycling, the area contained rows of drums labeled as nonhazardous waste. Most of the nonhazardous waste was waste indium that did not contain hazardous constituents such as selenium. Gallium, indium and copper are not hazardous waste metals.

WASTEWATER TREATMENT AREA

We entered the wastewater treatment area. I observed an open container of filters in a drum. The drum was not labeled as either hazardous waste or with other words describing the waste. According to the treatment operator, the filters are F006 hazardous waste. The filters were draining in the drum, as they had recently been removed. I explained that since the filters are hazardous waste they are to be covered and the container marked as hazardous waste or other words describing the contents of the container.

The wastewater treatment system uses filters and ion exchange canisters. I observed hazardous waste labels and accumulation start dates on the resin canisters that were in use. The resins were not waste, and therefore not required to be labeled. Additionally, the accumulation start date is the date the canister is taken out of service. Putting an accumulation start date on the canister in use could result in misleading dates when the resin becomes spent.

I observed several totes in the wastewater treatment area and a blue drum. One tote was marked as lab wastewater, but was not marked with an accumulation start date. For satellite accumulation the container must be at or near the point of generation, which means within the same room and or line of sight. Additionally the quantity must not exceed 55-gallons. Tote containers are generally 275 gallon capacity. If the container is over one-fifth filled, it contains over 55-gallons. This container was almost half full, and did not appear to be at or near the point of generation. The laboratory operator confirmed the totes and blue drum contained hazardous waste.

The blue drum and other tote container were not marked with contents or the words hazardous waste. The treatment operator placed hazardous waste labels on the containers. The waste was generated in the treatment area, and the blue container can be satellite. The tote can be a satellite accumulation container, as the waste is generated in the wastewater treatment area, but only until it is approximately one-fifth full. After reaching the 55-gallon limit the tote will need to be marked with an accumulation start date and the words hazardous waste. Most generators limit the satellite accumulation containers to 55-gallon drums and then move the full drums to a 90-day (for large quantity generators) or 180-day (for small quantity generators) accumulation area.

WASTEWATER AND DEBRIS STORAGE

We entered an area between the production plating and the wastewater treatment. I observed four one-cubic yard boxes with contaminated debris. According to personnel on site this debris is hazardous waste (F006 and or D010), it was not labeled as hazardous waste or marked with accumulation start dates.

I observed four tote containers, 275-gallon capacity. These totes were marked as hazardous waste, to be treated in the wastewater treatment unit possibly. Some of the totes contained labels with pH and metals content written on them. Three of these totes were dated as generated February 20, 2015 the other tote was dated March 15, 2015.

At the end of this room I observed five drums of liquid hazardous waste labeled as hazardous waste, three drums were dated July 10, 2015, one was dated December 1, 2014, and one was dated January 19, 2015. I observed an additional five drums marked as solid hazardous waste, one was marked January 23, the year was not legible it looked like 2013 but was likely 2015; one was marked January 26, 2015; two were marked January 15, 2015; and one was dated March 1, 2015. I observed two drums marked hazardous waste with cadmium ammonia dated December 23, 2014 and February 1, 2015. The solid hazardous waste drums were placed in a manner that did not allow easy access to all drums and one drum was placed in a manner so its label was not visible without moving the drum.

On the other side of the room near the wall, I observed eight resin canisters marked with dates of expiration: one canister was marked June 20, 2015, another June 9, 2015 and two were marked August 15, 2015. I asked if the resin was hazardous waste, and was told that it is hazardous waste. The canisters were not marked as hazardous waste.

Across the wall from the hazardous waste area, Solopower is storing chemicals that are for reuse. These chemicals consist primarily of indium and gallium, which are not characteristic hazardous waste metals. These chemicals should be inventoried and characterized for pH, to ensure the materials will not be hazardous waste when disposed.

PLATING AREA

SoloPower has an elevated enclosed plating line. The rinse waters for plating are recycled online using an ion exchange system. The filters and resins from rinse tanks when spent are F006 hazardous waste. I also observed several containers and a tote used for storing hazardous waste with selenium. The tote used for accumulating selenium was over half full and was not labeled as hazardous waste, the funnel on the top was open. SoloPower closed the funnel. I observed two drums marked as containing selenium; one of the drums was open. The drums were less than half full, and can be considered satellite. I recommended only using one drum, unless there was a difference in the wastes.

I observed two totes of wastewater at the end of the plating line. I was informed that this water was not selenium contaminated, had a fairly neutral pH and was not considered hazardous waste. I observed filters along the plating line, in addition to the ion exchange canisters there were particulate filters. I did not observe any spent filters in this area.

PRODUCTION AREA

The hazardous waste is generally plating related. We observed the machines used to make the solar panels and to cut panels into pieces. I observed some alcohol usage, but the waste appeared to be limited. Silver is also used in manufacturing and may be precious metal exempt, but cannot be speculatively accumulated. At the time of the site inspection SoloPower did not have a recycler for its silver waste.

I informed Ex. 6 PP / Ex. 7(C) that I would return to finalize the inspection once Ex. 6 PP / Ex. 7(C) returned. We briefly looked for manifests and records, but they were not readily available. On December 11, 2015, I returned to SoloPower accompanied by Heather Kuoppamaki, DEQ Solid Waste Engineer. We met with Ex. 6 PP / Ex. 7(C) I asked to revisit the site walk that I performed earlier.

We started at the 90-day accumulation area, and discussed the one-cubic yard containers, noting that waste exceeded the accumulation time standard and one container was not labeled. We discussed the pails of selenium waste, that was set aside for recycling. We entered the wastewater treatment area and the filters that were formerly in an open container were now covered and marked as hazardous waste. A staff person labeled other hazardous waste containers, and we discussed satellite accumulation.

We entered the area that the four totes of contaminated debris were located and confirmed the debris was considered hazardous waste, but was not labeled as hazardous waste or marked with accumulation start dates. We also observed the four totes of liquid waste, marked as hazardous waste that had dates exceeding the 90-day standard, and observed the 12 drums of solid and liquid hazardous waste that exceeded time standards. We then observed the resin cylinders and confirmed it was managed as hazardous waste but not marked as hazardous waste. The time exceeded accumulation standards. Two additional drums were located in this area that exceeded accumulation time standards. We entered the plating area and found all containers were closed and the selenium container had a hazardous waste label on it. We then went to review records for the facility.

RECORD KEEPING AND REPORTING

Spill Contingency Plan

SoloPower has an up to date Contingency Plan that has current employees as contacts. SoloPower should ensure that this current plan was submitted to the Fire Department, Police, and hospital.

Training Records

SoloPower has training plans and documents. The most recent training was 24-hazwoper. In addition employees are trained on hazardous waste management.

Waste Manifests/LDRs/Waste Analysis/MSDS

SoloPower maintains copies of manifests that are signed at the time waste is transported from the site, but the copy signed by the TSD was not available at the time of the site inspection. DEQ requested SoloPower review its procedures and determine whether another department is maintaining the signed copy of the manifests.

Weekly Container Inspections

SoloPower is conducting weekly inspections in its 90-day area.

EXIT INTERVIEW

Additional Information Requests Made: DEQ requested SoloPower review its procedures for managing manifests, as the copies signed by the TSD were not maintained in the files DEQ reviewed. SoloPower is to determine if those copies are maintained on site.

DEQ informed SoloPower that it would review its enforcement guidance, but it was likely the violations observed would result in a referral for civil penalty.

Confirm compliance or identify violations if able:

- Failing to place an accumulation start date on a container used for accumulation of hazardous waste (1 cubic yard container in 90-day area, 1 half full tote in wastewater treatment area, and 4 one-cubic yard containers of debris/PPE between waste treatment and plating);
- Failing to remove hazardous waste within 90-days of the accumulation start date (5 one-cubic yard containers in 90-day area, 4 one-cubic yard containers between plating and waste treatment, 12 drums between waste treatment and plating, 4 resin canisters between plating and waste treatment);
- Failing to mark containers with the words hazardous waste (a cubic yard container in 90-day area, 4 one-cubic yard containers of debris in area between wastewater treatment and plating, 8 resin containers in area between wastewater treatment and plating, and one tote in plating);
- Failing to close hazardous waste containers (one drum of filters in wastewater treatment and one tote container in plating);
- Satellite containers not marked as hazardous waste or other words signifying contents (one drum of filters in the wastewater treatment area, one tote in wastewater treatment area, one blue drum in wastewater treatment area).
- Lack of sufficient aisle space in 90-day area and with five drums of selenium hazardous waste.

Silver waste may be managed under the precious metal exemption if it is recycled. Selenium may be valuable product if it is sold, however, if spent it must be used as a direct substitute for a commercial chemical product. SoloPower is to send DEQ further information on these waste streams, including the final destination of the selenium in buckets and the silver contaminated wastes. These wastes are subject to speculative accumulation.

ADDITIONAL RECOMMENDATIONS

Ex. 6 PP / Ex. 7(C) indicated that SoloPower is a start up company and is seeking financing. It appears that originally SoloPower had a large staff, but its staffing is now substantially reduced. SoloPower does not have a dedicated environmental staff. DEQ recommends SoloPower either hire a consultant or staff adequate to address environmental compliance.

There is one tote with silver waste and five buckets of selenium paste waste. The silver waste is precious metal exempt if it can be recycled. The selenium paste may be product if it can be directely reused. Both the selenium paste and the silver waste are subject to rules regarding speculative accumulation. Please provide DEQ with additional information regarding the silver and selium, specifically provide the names of the companies these items will be sent to. For the selenium please provide information regarding how the company receiving this waste will manage it.

POST INSPECTIONS ISSUES

Remove hazardous waste that has exceeded the time standard for on site accumulation. Set in place management standards for labeling and dating hazardous waste containers.

CONCLUSIONS & RECOMMENDATIONS

According to DEQ's enforcement guidance, failing to mark accumulation start dates and failing to timely transport hazardous waste off site for proper management or disposal are violations that warrant a Pre-Enforcement Notice and referral for civil penalty.

Appendix: ATTACHMENTS

A) DEQ Inspection Photograph Log

B) Please see the file for the following attachments:
- Hazwaste.net
- OHWIME for annual reports
- Responses: emails, letters, correspondence, corrections to inspections
- Timeline tracking sheet
- Inspection Checklist
- Past Enforcement Actions